

## Exploration of biopesticidal potential of *Acacia concinna* and *Momordica charantia*

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### ABSTRACT

Sustainable development demands exploration at Biopesticidal potential of plants. Botanical pesticides are biodegradable, safer alternative to the synthetic pesticides. Tropical plants provide a rich source of phytochemicals which exhibit antimicrobial, insecticidal properties. *Acacia concinna* and *Momordica charantia* have shown a good antimicrobial and insecticidal role. So their combined application to control insects of crop and ornamental plant as well as antimicrobial properties can be step close to eco-friendly world. Investigations are under progress with respect to their phytochemical aspects.

**Key words:** Biopesticides, *Acacia concinna*, *Momordica charantia*, plant pathogens

### INTRODUCTION

Microbial pathogens like *Puccinia* sp. fungus causing rust, *Xanthomonas citri* causing damage to hosts, require regular spraying of pesticides. Residual nature of chemical pesticides is dangerous to disturb soil and environmental quality. So, biopesticides extracted from plants like *Acacia concinna*, *Momordica charantia* can prove a good eco-friendly safer way to control these microbes.

*Acacia concinna* is a tree native to Asia belonging to the family Fabaceae and sub-family Mimosoideae. It is commonly called as *Shikakai*. Saponin extracts of the pods of *Acacia concinna* are reported to have Immunological Adjuvant activities in mice (Kukhetpitakwong *et. al.*, 2006), alcoholic extracts of the plant also showed antifungal activity (Ahmed *et. al.*, 2002).

*Momordica charantia* also known as bitter melon is a vine belonging to the family

Cucurbitaceae. Fruit extract of this plant demonstrated Antioxidant and Chemoprotective properties (Semiz and Sen, 2007). It is reported to have antibacterial activities (Narayanan and Jolly, 1994) and mosquito larvicidal properties (Singh *et. al.*, 2006).

This pieces of work is attempting to check antimicrobial properties of the plants by taking their ethanol extract and used to observe their antibacterial response for *Xanthomonas citri* and antifungal for *Puccinia cannae*. To know phytochemical nature of plants materials the gas chromatography is performed.

### MATERIAL AND METHODS

#### Isolation of pathogen

Organisms isolated from infected fruit after proper distribution of outer surface with HgCl<sub>2</sub> the infected portion is removed and crushed between two slides, gram staining is carried out to confirm the organism (gram-ve rods) and material is

structured in sterile chalk agar medium. Incubation at room temperature 48 hrs. Colony characteristic of isolated colony is recorded and organism is confirmed by gram staining motility.

#### Sensitivity test

Water extracts are prepared from plant material using aseptic condition and distilled water (1% solution). Sensitivity test is carried out in sterile nutrition agar plate by using filter paper disc method. Sterile filter paper discs are dipped in the extract and placed on sterile nutrient agar plate spreaded with isolated pathogen. (*Xanthomonas citri*).

Plates incubated at room temperature after 24 and 48 hrs diameter zonal inhibition of growth around this is measured and recorded Table 1.

*Puccinia cannae*, a fungal pathogen on *Canna* Sp. was inoculated by sapling inoculation

method. The extract was sprayed with various synergistic concentrations of *Acacia* and *Momordica* observations were noted Table 2.

Ethanollic extract was utilized Gas chromatograph for observing the active peaks with carrier gas N using GC-Alltal Cat No. 13878 with hydrogen flame for *Momordica charantia* and *Acacia coccinea*.

Table 1:

S. No.	Name	Zone of inhibition (mm)
1.	<i>Momordica charantia</i>	05.0
2.	<i>Acacia conciana</i>	07.0

Table 2: Testing of fungitoxicity of plant extracts

Days of experiment	SET -1	SET -2	SET -3
05	-	-	-
10	Appearance of yellow pustules	no symptoms	no symptoms
15	Spreading and increase in Number of pustules	no symptoms	no symptoms leaves dried
20	Pustules turned black	no symptoms	no symptoms Leaves dried
25	Dry appearance and Heavy chlorosis	no symptoms	no symptoms leaves dried
30	Complete chlorosis of leaves And stunted growth. No flowering	normal healthy growth of plants	no symptoms leaves dried

SET 1: Controlled without spraying of extract. Inoculated with fungus Uredospores

SET 2: Spraying with dilute extract in D. W.(25%). Inoculated with fungal Uredospores

SET 3: Spraying with Concentrated ethanolic extract. Inoculated with fungal Uredospores

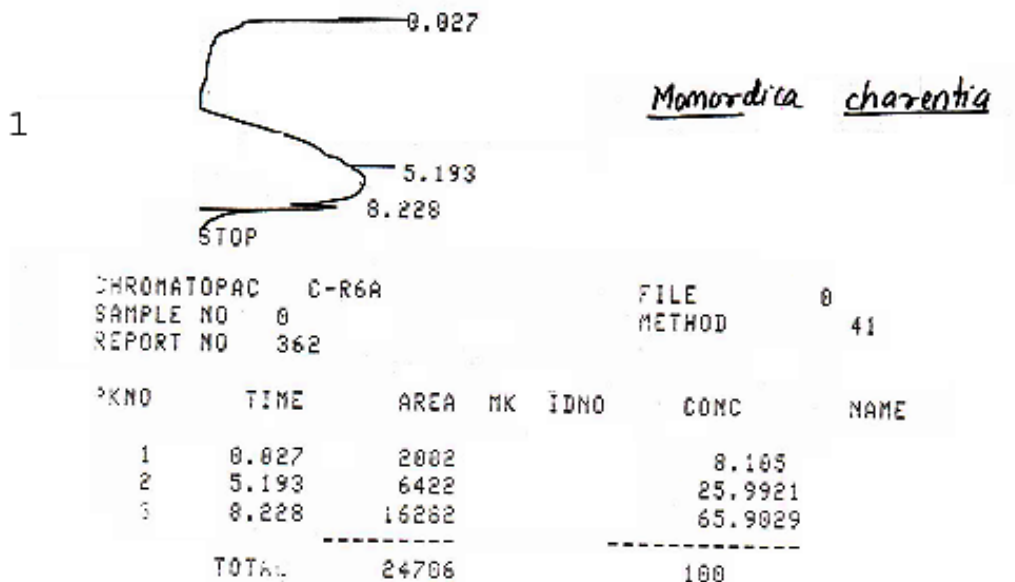


Plate 1:

**RESULTS AND DISCUSSION**

1. Zonal inhibition indicated positive control of *Xanthomonas citri* in water extract *Acacia concinna* is more effective than *Momordica charantia* (Table 1)
2. Synergistic effect of *Acacia* and *Momordica* at lower concentrations has proved effective in controlling rust of fungus *Puccinia*. Higher ethanolic concentration shown burning of leaves (Table 2).
3. *Momordica* showed active 3 peaks indicating presence of active compounds(Plate 1) and *Acacia concinna* showed no response for ethanol extract through Gas Chromatography Table 3.

Table 3: Positive peaks obtained for plants

Name of plants	Peaks obtained	Probable active compounds
<i>Momordica charantia</i>	3	Momordin, Cucurbitin
<i>Acacia concinna</i>	-	-

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